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CITATION:

SATO, Hiroaki. Folk Etiology among the Baka, a Group of Hunter-Gatherers in the African Rainforest. African study monographs. Supplementary issue 1998, 25: 33-46

ISSUE DATE:

1998-03

URL:

https://doi.org/10.14989/68393

FOLK ETIOLOGY AMONG THE BAKA, A GROUP OF HUNTER-GATHERERS IN THE AFRICAN RAINFOREST

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ABSTRACT This paper addresses the structure of traditional medical belief and knowledge with special reference to etiology among the Baka hunter-gatherers living in the tropical rainforest from northwestern Congo to southeastern Cameroon. A group of the Baka in northwestern Congo has 89 folk illness terms. The illnesses are classified into three groups by the type of cause. The first group consists of 8 illnesses which develop exclusively due to specific causes such as contacts with various pathogenic substances, violation or sorcery. The second group consists of 55 illnesses which develop spontaneously or due to specific causes. The third group consists of 26 illnesses which develop purely spontaneously. In the Baka folk etiology, the naturalistic notion that some natural entities are responsible for the occurrence of illnesses is more predominant than the personalistic notion that some agents, such as sorcerers, evil spirits, and ghosts, cause illnesses. Among various pathogenic substances, animals are major pathogens. Forest animals, whose bodily shapes or behavior look strange or unusual to human beings, seem to provide good materials to the Baka who wish to explain and understand what causes illnesses, an abnormal state in body and mind, without warning. The Baka people think that almost all of their folk illnesses may develop spontaneously too. Their search for pathogenic substances of their illnesses seems neither for the purpose of removing it nor cutting off contacts with it, but for the purpose of seeking specific remedies.

Key Words: Baka hunter-gatherers; Ethnomedicine; Folk etiology; Forest animals; African rainforest.

INTRODUCTION

The Baka, a group of hunter-gatherers in the tropical rainforest from northwestern Congo to southeastern Cameroon, who have been known as Pygmies, have a population of about 33,000 (Cavalli-Sforza, 1986) and speak the language belonging to Adamawa-Oubanguiien (1A6) of the Niger Congo (Greenberg, 1970). They maintain an unique culture and live fairly dependent on natural forest resources, although most of them make swidden fields and have close socio-economical relation to their neighboring farmers (Sato, 1991, 1992).

Whereas the humid tropical forest environment supplies plenty of useful resources to the Baka, it also brings about various hazards and illnesses to them. The rate of infant mortality of the Baka, the official data of which is not avaiable, is still high according to our small-scale interview survey (Sato, unpublished data). It seems difficult for them to keep their health to old age. The Baka people pay great attention to illnesses and their cure, and use various herbal medicines practically day after day. I collected about 90 illness terms excluding words concerning symptoms and the data of more than 400 kinds

of folk remedy made of wild plants in a settlement of the Baka. Although the question of "How do the Baka practically cope with illnesses? " is important, we will report it elsewhere. Here, I will discuss another question, "How do the Baka think about illnesses and their cause?" All the groups of hunter-gatherers in the African tropical rainforest and their neighboring farmers are socio-economically interdependent, but the former group keep their own culture distinct from the latter. Medical belief or medical knowledge is a case in point. When the Baka people talk about illnesses, their cure, their remedy or their cause, their talk is filled with words concerning various forest things such as animals, plants, and soil. On the other hand, sorceries, malevolent spirits or supernatural agents which are suspected to cause someone's misfortune or illness is the center of public interest among African farmer groups (Kakeya, 1977; Yoshida, 1986). Why does such a difference occur? The present paper aims to clarify the structure of the Baka folk medical knowledge and belief for a clue for the solution of the above question, from the etiological perspective.

STUDY AREAS AND METHODS

I conducted field surveys at two sites: the Gomani settlement near Souanke town, a capital of the Souanke District in northwestern Congo, and the Baka settlement near Ndongo village on the border of Congo in southeastern Cameroon (Fig.1). In the present paper, the word, "settlement," will be exclusively used to describe the assembly of hunter-gatherer houses and the word, "village," the assembly of farmer houses (see Sato, 1992). The data were collected mainly at the former settlement from October 1990 to January 1991. In addition, I collected supplemental data at the latter in 1994. The number of inhabitants of Gomani settlement was about 110. Besides hunting-gathering activity, the inhabitants of Gomani settlement subsist on their own fields and by assisting of farmers'fields and stores in Souanke town. They usually live in their semi-permanent settlement about 2 km to Souanke town and occasionally enter forests to do hunting, gathering or fishing from a few days to a couple of months. Their neighboring farmers are Bakwele, Jem and Fan.

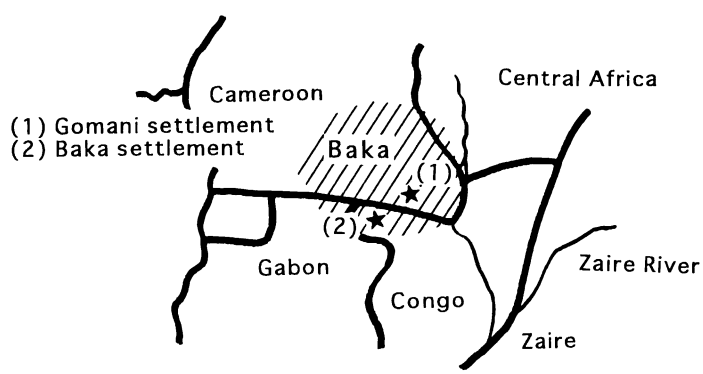

Fig. 1. Territory of the Baka and the study site.

In 1990, the inhabitants of Gomani had two main resources of medical care: the scientific medicine and the folk medicine of the Baka. Although there was a hospital in Souanke town which could provide effective modern medical services, it constantly had a shortage of medicine. Therefore, the inhabitants of Gomani had practically no other medical resource than their own folk medicine. There was no special diviner, *ngàngà*, at Gomani settlement. In general, a *ngàngà* divines to find out causes of illnesses or other misfortunes, especially serious ones, diagnoses and prescribes various folk remedies. He/She plays an important role on the Baka folk medical systems. Even if the inhabitants had no *ngàngà*, they are not necessarily in trouble, because they can self-treat against most common illnesses, and usually they have substitutes for *ngàngà*: for example, the elderly. Most Baka adults have ample knowledge of general illnesses and their remedies. The Baka visit *ngàngà* or the elederly when suffering from serious illnesses with which they can hardly cope by themselves. *Ngàngà* or some elderly have greater folk medical knowledge, especially that of folk remedies. At Gomani settlement, there were such elderly: two men and a woman. I saw not only the Baka inhabitants but also many neighboring farmers frequently visiting them to ask for some medicine during my stay. It is the folk medical knowledge and belief of these elderly that the present paper deals with. An effective method to understand the structure of folk medical systems is to observe and analyze many actual cases. It is difficult, however, to observe many cases, enough to analyze within a limited study term. Another method is to systematically elicit the folk medical knowledge and belief from the informants who are recognized as professionals or semi-professionals. I have used the latter method. Although this method is convenient, there is a risk: a gap between theory and practice. To fill such a gap, I observed as many actual cases as possible. I collected data from informants by numerous interviews. Interview items included illness terms, etimology of illness terms, folk belief of illnesses, description of symptoms, causes of illnesses, folk remedies and so on. The informants consisted of three persons: two men who were over 50 years old, and a middle-aged woman who was recommended by the two male informants because she was well-informed in the folk medical knowledge. The Lingala language, a lingua franca in middle Africa, was used for the interviews. Since the old woman mentioned above did not speak Lingala, I had to enlist the middle-aged substitute.

The Baka language[1] has three tones. In the paper I used the following accent symbols: an acute accent (´) for the high tone, no symbol for the middle one and a grave accent (`) for the low one.

ETIOLOGY

I. Causes of Illnesses

I collected 89 illness terms excluding words concerning symptoms in Gomani settlement. Every informant knew all of these 89 illnesses. Almost all the terms are expressed in the word form of *kò*-xx. Phenomena to which the word of *kò* refers, correspond to illnesses. *Kò* means nothing else than illnesses. There are many terms referring to symptoms such as fever, a pain, and diarrhea, and the 89 illnesses and their symptoms will be described in detail elsewhere.

Although the informants explained various causes of folk illnesses, I have selected 9 examples here because of limited space.

Example 1. *kò-nà-gubà* (the illness of *gubà*, peanuts): This illness, symptomatic of diarrhea and blood in the stool, can be caused by overeating raw peanuts.

Example 2. *kò-à-kokòlo* (the illness of *kokòlo*, a tree pangolin): This illness, an infant abdominal disorder, can be caused if a host's parent took *kokòlo* meat before his/her birth or during lactation period.

Example 3. *kò-nà-mbambì* (the illness of *mbambì*, an African monitor): This illness, with upset stomach, can be caused by watching a *mbambì*.

Example 4. *kpékésíó* (gonorrhea): This illness can be caused by sexual intercourse with a patient or by stepping on patient's urine.

Example 5. *kò-à-lìkpongbolo* (the illness of *lìkpongbolo*, a kind of bat): This illness of infant constipation, can be caused when a host's mother steps on the feces of *lìkpongbolo*.

Example 6. *botelabotela* (abscess on a foot): This illness can be caused when a host steps on *efanja*, a kind of mole cricket, and the *efanja* poison gets into his/her foot.

Example 7. *ìimbì*: This illness, an infant illness of weakness or growth delay can be caused when host's parents violate postpartum sexual taboo, having the first postpartum sexual intercourse without any ritual, or the host's mother conceives after extramarital affairs.

Example 8. *mbènjà* (hernia, especially rupture): This illness can be caused when a host crosses over a vine laid across by a sorcerer (*mbu*).

Example 9. *banjo*: This illness of disorders of both sides is thought to develop spontaneously regardless of any specific causes.

Apart from the spontaneous development illustrated in the last example, numerous specific causes mentioned by the informants, could be classified into four types: 1. eating some pathogenic foods; 2. non-ingestive contacts with something pathogenic; 3. violation of some social bans or norms besides food taboos; 4. sorcery.

The first and second examples represent the above type 1. There is, however, a difference between these two examples. While in the first case the hosts who become ill are the eaters themselves, in the second case the hosts are the children of eaters. The Baka people think that some pathogenic foods taken indirectly as well as foods directly taken for dietary purposes, can cause illnesses.

The third to sixth examples represent the above type 2. Here such substances as foods, animals, persons, or their discharge are thought to be pathogenic. There are many ways hosts contact pathogenic substances: for example, sexual intercourse with sick persons, or stepping on their urine (Example 4); stepping on poisonous animals (Example 6); watching pathogenic animals (Example 3); and stepping on the discharge of pathogenic animals (Example 5).

The seventh example represents one of the illnesses from which hosts suffer from their own or their parents'violation of social bans or norms besides food taboos. Such illness-causing violations include extramarital affairs and thefts.

The eighth example, *mbènjà*, is one of several illnesses which are often rumored to be caused by sorcery.

Unlike the eight examples previously mentioned, Example 9 is one of the illnesses which are thought to develop purely spontaneously. In addition to such illnesses, most illnesses which develop due to some specific causes are also believed to develop spontaneously.

Eighty-nine illnesses were classified into three groups according to the type of causes (Table 1). The first group consisted 8 illnesses which developed exclusively due to some specific causes, the second group, 55 illnesses which developed spontaneously or due to some specific causes, and the third, 26 illnesses which developed purely spontaneously. Of 89 illnesses, 63 (70.8%) were thought to develop due to some specific causes and 81 (91.0%) to develop spontaneously. While the Baka informants paid great attention to direct or indirect contacts with various pathogenic substances, social violation and sorcery, they also thought that almost all illnesses developed spontaneously.

As shown in Table 2, among the above 4 types of specific causes, contacts with some pathogenic substances were thought to be fairly more responsible for causing illnesses than social violation or sorcery.

Table 1. Classification of folk illnesses by type of cause.

Type of illnesses	Number of illness N=89	%
A	8	9.0
B	55	61.8
C	26	29.2

A: illnesses developing due to some specific causes
B: illnesses developing spontaneously or due to some specific causes
C: illnesses developing spontaneously without any specific cause

Table 2. Specific causes of 63 illnesses of Type A and B.

Type of cause	Number of illness*	%
eating pathogenic food	32	50.8
non-ingestive contacts with pathogens	33	52.4
violation except that of food taboos	9	14.3
sorcery	9	14.3

*: More than: one type of cause is supposed to be responsible for the occurrence of some illnesses.

II. Food-eating as Cause of Illnesses

(1) Foods causing illnesses

The types of foods that can cause 32 illnesses are shown in Table 3. Mammals include three species of forest duikers: *bèmbà, Cephalophus sylvicultor* Afzelius; *mònjumbe, C. nigrifrons Gray; mòòè, C. leucogaster* Gray, two genera of wild carnivores: *sin, Genetta* sp.; *súà, Panthera pardus* L., a species of primates: *kàtu, Perodicticus potto*, a genus of pangolins: *kokòlo, Manis* sp. and two kinds of wild rodent (unidentified): *bílì* and *físè*. Fishes include four kinds of fresh water fishes which have four different vernacular names (electric catfish: *gbìgbì, Malapterurus electricus* Gmel.; elephant-snout fish: *mbòsè, Mormyrus* spp.; lung-fish: *mónga, Protopterus* spp.; *kúsà*, unidentified). In addition, the Baka folk etiology holds that any fish can cause infant-illness called *kò-nà-si* (the illness of fishes). Body parts of game include bone marrow, brain, liver and

elephants' feet. Plant foods responsible for causing 7 illnesses include plantain bananas, sugar canes, peanuts, papayas, maize and fruit of oil palm. It is noteworthy that all these plants food are cultivated, not wild.

Table 3. Type of illness-causing food.

Type of food	Number of illness	Number of infant-illness
animal	23	10
mammal	8	2
bird	1	1
fish	5	3
tortoise	1	
crab	1	1
shrimp	1	
caterpiller	1	
snail	1	1
part*	4	2
plant	5	
clay	1	1
honey+plant	1	
mammal+plant	1	
any food	1	1
Total	32	12

*: Parts of the body of some game.

(2) Intake restriction of food that may cause illnesses

The idea that dietary foods may cause illnesses or have illnesses, of course, influences the eating behavior of the Baka. They usually avoid eating such pathogenic foods as may affect themselves or their infants. The extent of avoidance, however, varies from food to food. In general, it seems that the Baka more readily avoid eating pathogenic animal foods than the other foods. Above all, animals that may cause infant-illnesses are most strictly avoided by infants, their parents, pregnant women, and their husbands. Other foods, such as plants, honey or clay, are rarely avoided. It is partly because simply eating these foods does not cause illnesses but overeating them do (Example 1).

(3) Effects of pathogenic foods

How do the Baka understand the influence of pathogenic foods on their bodies? When I ask the Baka why they avoid some food, or why fall ill if they don't, they always answer, "Because there is an illness within that food," or "It has an illness." Moreover, they believe that its pathogenic effects persist in the eater's body once it is eaten. Such pathogenic foods are fairly different from our dietary foods which may cause food poisoning through microbial contamination and rendered inedible. Although pathogenic foods in the Baka folk etiology also do not always cause illnesses and may be eaten depending on the situation, they are dangerous by nature and even if they were eaten a long time ago, their pathogenic effects could remain. In addition, it is believed that their pathogenic effects can be transmitted from parents to their children through intermediaries. When I asked my informants why the children who themselves had never

eaten the pathogenic foods got some illnesses, they answered, "Because the water of pathogenic foods mixed with the blood, semen or milk of their parents and was transmitted to their body."

III. Non-ingestive Contacts with Pathogens

(1) Types of pathogens by contacts

Non-ingestive contacts with pathogens can cause 33 illnesses. These pathogens include animals relating to 18 illnesses, sick persons relating to 11, white fat in the pores on human noses relating to 1, plant food relating to 1, some other persons relating to 1 and a kind of medicine relating to 1. Several pathogens have pathogenic effects in their urine, feces, blood, tracks, refuse after eating, or sound made during feeding. Pathogenic animals include eight types of mammals (a leopard: *Panthera pardus* L., two species of forest duikers: *Cephalophus nigrifrons* Gray; *C. leucogaster* Gray, a species of primates: *Perodicticus potto*, a kind of wild rodent: *bílì*, a genus of pangolins: *Manis* spp., unidentified bats: *likpongbolo* and unidentified moles: *mòtò*), a bird (a species of hornbill: *kàta*, *Anthracoceros coronatus*), a reptile (African monitors), three kinds of insects (mole crickets, mosquitos: *ngùngù* and bloodsucking flies: *uósili*), two kinds of caterpillers: *dulu* and *kpókòlò*, lice: *síli*, bed-bugs: *ètòtò*, and slugs: *elándi*. In addition to these animals, there are two kinds of animals which need explanation: *èkàlo* and *yolì*. *Èkàlo* is a soldier termite, which is believed to be put into the sexual organ of a profligate man by magic doctors and to cause pain in his sexual organ in bad conduct. *Yolì* is an imaginary animal with a snake-like body, changes its body color like a rainbow and speaks any language. It is believed that *yolì* living in the forest invades the body of a passing victim and causes an illness which trembles the affected part. Sick persons also are of importance as pathogens. In the Baka folk medical knowledge there are no corresponding terms for infectious or contagious diseases in the scientific medicine. The Baka people, however, have a term, *bubbá*, a group of illnesses which are believed to spread over a camp as soon as introduction. They know the ways such illnesses spread: infectiously, e.g. staying with sick persons, and contagiously, e.g. sexual intercourse.

(2) Ways of contacts with pathogens

There are many ways of direct or indirect contacts with pathogens (Table 4). The main ways of direct contacts are sexual intercourse with sick persons, stepping on some pathogens, touching pathogens, bites by pathogenic animals, and direct invasion by pathogenic animals. An interesting case of folk medicine can be added to the list. Some kinds of medicine applied to hosts'arms to assist in successful hunts or winning fights may cause pain when hosts cancelled hunting or fighting. The main indirect contacts included stepping over a sick person, watching pathogenic animals and staying with sick persons. Furthermore, there are a number of illnesses with which the children can be affected indirectly, when their parents killed, touched or watched pathogenic animals, or stepped on the discharges of pathogens. It is also believed that the non-ingestive effects

of illnesses which affected the parents'bodies can be transmitted to their chidren by blood, semen or milk.

Table 4. Ways of non-ingestive contacts with pathogens. N=33

Way of contacts	Type of pathogens	Number of illness***
a host or its parent		
stepping on	urine*	7
	feces of p. a.**	1
	blood of p. a.	1
	refuse after eating	1
	tracks of p. a.	1
stepping over	sick persons	1
watching	live or dead body of p. a.	6
touching	live or dead body of p. a.	4
eating	a poisonous animal	1
hearing	sound made by p. a.	1
having intercourse with	sick persons	2
staying with	sick persons	6
being bit by	pathogenic animals	3
being invaded directly by	pathogenic animals	4
a medicine		
affecting the part to which it was applied	medicines	1

*: The urine of someone else, sick persons or those who ate pathogenic animals.
**: Pathogenic animals.
***: More than one way of contacts with pathogens is supposed to be responsible for the occurence of some illnesses.

IV. Violation as Causes of Illnesses

There are 9 illnesses caused by violation of social bans or norms besides food taboos. Among many forms of violation, sexual violation, which can cause 7 illnesses, is the most major cause (Table 5). Sexual violation includes extramarital affairs, violation of postpartum sexual taboo, indulging in sexual intercourse in the daytime and coughing during sexual intercourse. There are two other types of violation causing illnesses. The first is the violation of a dietary manner that men and women must not eat the meat of *kùnda*, a kind of tortoises, together at the same place. The second is the theft of *dàndù*, a kind of wild honey, in the tree which someone else cut down to obtain honey. The Baka

Table 5. Type of violation causing illnesses. N=9

Type of violation	Number of illness*
sexual violation	7
extramarital affairs	6
violation of postpartum taboo	1
intercourse in daytime	1
coughing during sexual intercourse	1
violation of dietary manner	1
theft of the other's honey	1

*: More than one type of sexual violation is supposed to be responsible for the occurence of some illnesses.

have great interest in sex. For example, they like gossips about sexual relations. Adult men are exceedingly fond of tonic medicine to attain sexual power. Generally speaking, the Baka are not strict with manners and customs of sexual behavior. They, however, have dichotomic attitude to the violation of sexual norms as causes of illnesses. When I asked my informants questions about *kpékésíó* (gonorrhea), *èkàlo* (mentioned above) or *mbénja* (a hernia) all related to the violation of social bans or norms, particularily sexual, they answered by laughing. Their laugh seemed to imply that persons who do what they please invite their own illnesses. The case of *ìimbì* (see Example 7) is not a laughing matter. First, *ìimbì* makes infants fall into critical condition. Secondly, the parents of sick little children, especially the mothers, are apt to become the targets of blame. It is because mothers' extramarital affairs result in babies whose fathers are unidentified. According to my informants, when blood of more than two men mix in the blood of such a baby, it causes *ìimbì*. Identification of a baby's father is a very important problem for the Baka people which have patrilineal and clan-exogamous systems.[2]

V. Sorcery as Causes of Illnesses

Nine illnesses can be caused by sorcery according to the informants. Above all, of nine illnesses, *yeka*, a mental illness and *mbéngà* with indefinite symptoms are thought to be caused only by sorcery. *Mbéngà* meaning a lance or lances is believed to be caused by the lances shot by sorcerers. Sorcerers may shoot at victims not real lances, but anything, e.g. cigarrets and wastepaper. What symptoms victims have depends on the body parts where sorcerers target *mbéngà*. Except shooting *mbéngà*, there are many methods of sorcery: directly poisoning a victim, beating the victim's head, or serving poisonous animals to a victim (Table 6). Every illness of which sorcery is a suspected cause is severe, protracted, and/or fatal. The Baka are apt to suspect sorcery in any illness that is intractable and/or grave. However, even if sorcery is suspected, the sorcerer is seldom investigated. Although the Baka society has diviners called *ngàngà*, who divine by means of studying the fur of *sin*, a kind of genet or watching a fire, they are rarely asked to identify the sorcerers. I often heard that some victims had died by someone's sorcery, but never heard that the sorcerer had been found out and punished. It seems that the Baka do not pay much attention to sorcery as causes of illnesses as

Table 6. Method of sorceries causing illnesses. N=9

Methods of sorcery	Number of illness*
sorcerers	
beating victim's head	1
throwing a lance to a victim	1
making a victim cross a barrier	1
serving poisonous animals to a victim	1
making a victim step on poisonous blood	1
poisoning a victim	5

*: Two types of method of sorcery are supposed to be responsible for the occurence of an illness.

African horticulturalists do (Kakeya, 1977; Yoshida, 1986).

VI. Animals as Pathogens

Of 89 illnesses, fifty-one can be caused by contacts with some pathogenic substances. Contacts include direct contagion, indirect infection and eating. Table 7 shows the types of pathogens responsible for the occurrence of these 51 illnesses. Animals are the most major pathogenic substances. Furthermore it is noteworthy that 34 different kinds of animals or their body parts as pathogens are responsible for the occurrence of 34 different illnesses except for one caused by any edible fish, that is, each pathogenic animal has a peculiar illness to it. Such specific etiology also applies to the cases of illnesses which plants and other pathogenic things except human beings can cause. A predominant principle for linking a certain animal to a specific illness as cause and effect seems to be homeopathic thinking or metaphor. For example, *kò-à-lìkpongbolo* (the illness of a kind of bat) which causes infant constipation is explained by the Baka as follows. This bat which always eats and sleeps rarely discharges feces because it has no bowel. When a mother steps on the bat feces, her infant becomes constipated. In the case of *kò-à-kàtu* (the illness of Bosman's potto), they explain that when someone ate, watched or touched Bosman's potto, it gives him/her such symptoms as fever, clenching of his/her fists, contraction and trembling which are similar to the behavior of Bosman's potto.

Table 7. Type of pathogens responsible for 51 illnesses caused by contacts with pathogenic substances.

Type of pathogens	Number of kinds of pathogens	Number of illnesses caused by each type of pathogens	Number of illnesses by ways of contacts with pathogens	
			Eating	Besides eating
animals	35	35(68.6%)	25	18
mammals	12	12	10	8
marrow	1	1	1	
brain	1	1	1	
liver	1	1	1	
elephants' feet	1	1	1	
birds	1	1	1	1
fishes	5*	5	5	
reptiles	2	2	1	1
other animals**	11	11	4	8
plants	6	7(13.7%)	7	
other things***	4	4(7.8%)	3	1
human beings	1	11(21.6%)		11

*: A kind of pathogens is any edible fish, not a specific one.

**: Including an imaginary animal (*yoli*) and the white fat (*mobombo*) in pores on human noses which is thought to be a kind of animal.

***: Including some food which was eaten by a mother before childbirth and can cause an illness (*ngoti*) of a new-born infant.

DISCUSSION

I. Is It "Naturalistic" or "Personalistic"?

Which is the Baka's folk etiology, "naturalistic" or "personalistic"? According to Foster (1976), two basic principles can be seen in the etiologies of non-Western medical systems, i.e. naturalistic etiology and personalistic etiology. In personalistic medical systems, disease is explained "as due to the active, purposeful intervention of an agent, who may be human (a witch or sorcerer), nonhuman (a ghost, an ancestor, an evil spirit), or supernatural (a deity or other very powerful being)." Naturalistic systems explain illness in impersonal systemic terms: "disease stems, not from the machinations of an angry being, but rather from such natural forces or conditions as cold, heat, winds, dampness, and, above all, by an upset in the balance of the basic body elements." In the Baka folk medical systems, personalistic etiologies are applied to the causes of limited illnesses. Baka culture has witches, sorcerers, and various nonhuman or supernatural beings, such as spirits of dead persons, spirits in the forest, and deities. However, sorcerers are the only agents which can conduct purposeful intervention to victims and cause illnesses. And it is only nine among 89 illnesses that sorcerers' intervention is usually mentioned as a cause. On the other hand, the Baka suppose that contacts with pathogens are responsible for causing most illnesses. Almost all of the pathogens are natural and ordinary things, neither supernatural nor malevolent beings. Even the imaginary animal, *yolì*, is not a spiritual being. Although the Baka medical systems do not have any theory concerning "the balance of the basic body elements" which characterizes many other non-Western medical systems as naturalistic systems, the notion that most illnesses can be caused by contacts with pathogenic but natural things suggests that the Baka folk etiology is naturalistic rather than personalistic. This Baka etiological notion is not so far from the theories of infection and contagion in the scientific medicine. The Baka folk medical knowledge, however, does not explain how illnesses transmit from sick persons to unaffected ones, whereas the scientific medicine explains it by the infectious or contagious transmission of microbes as pathogens. There is no notion of microbes as pathogens in the Baka folk etiology. According to the informants, the reason why direct or indirect contacts with pathogenic substances can cause illnesses is because various pathogenic substances themselves have some illnesses. Gardner (1996) described many microorganisms which invade human bodies and cause illnesses in the ethnomedicine among Paliyans, south Indian foragers. The Baka etiology does not have such microorganisms except a few alien entities: i.e., *efanja* (a mole cricket), the bite of which causes *botelabotela*, a kind of carbuncle on feet, *dulu* (white caterpillars which inhabit corncobs), the drill of which causes *nyángali*, decayed teeth, and *yolì*, mentioned above. In short, illnesses themselves are thought to move from primary hosts into secondary ones through direct or indirect routes. In other words, illnesses themselves are recognized as some entities like microbes in the scientific medicine.

II. Why Are Animals the Major Pathogens?

In a detailed report about food restriction of the Mbuti, a group of hunter-gatherers in

the Ituri forest, Ichikawa suggested that the reason why more than 90% of foods avoided by the Mbuti were animals was because the Mbuti thought that these animals were abnormal or marginal in the animal world, and therefore they had some supernatural power to cause diseases, an abnormal state to normal human beings (Ichikawa, 1987). Kuchikura also reported that, the Semaq Beri, a group of hunter-gatherers in the Malay Peninsula avoided eating various animals because these animals which had conspicuous characters such as bad smell or convulsions, brought them diseases (Kuchikura, 1981). Although neither studies mentions what proportion of the occurrence of illnesses these animals accounted for, the fact that almost all the objects which were avoided were animals suggests that animals are a major causal component responsible for the occurrence of illnesses in both these societies. Why do these hunter-gatherer groups consider that animals particularly can cause many illnesses? Ichikawa's theory of the disease-causing animals as abnormal or marginal in the Mbuti animal world that caused an abnormal state in humans is intriguing. I would like to slightly modify his view. Illnesses bring sick persons various symptoms and keep them in an abnormal or unusual state never experienced in daily life. It is likely that the Baka think that such an abnormal or unusual state in their body and mind is brought about by contacts with "abnormal" animals. The illness-causing "abnormal" animals include not only animals with particular conspicuous characters but also ordinary animals as the Baka informants said that every animal had some illness. All animals are very different from humans, and are unusual and diverse enough to be associated with varied abnormal conditions, i.e. illnesses.

Incidentally, why would the three groups of hunter-gatherers find causes of illnesses in the animal world? I think this is because these hunter-gatherers are familiar with forest animals. Illnesses bring sick persons various symptoms which can not usually be experienced and lead to occasional death. It is not uncommon that human beings become ill. Unless we can understand why such ilnesses occur or what causes such illnesses, we cannot live comfortably. We want to explain and understand all things in our world. Forest animals seem to provide good materials to the Baka who wish to explain illnesses and understand their causes. The Baka people, from adults to children, have great knowledge of forest animals. Men hunt and women fish. Animal behavior is a main topic of their conversation. They associate the abnormal and unusual conditions of the diseased minds and bodies with varied shapes, colors, cries and behavior of forest animals according to homeopathic thinking and identify causes of illnesses in forest animals. If their causes are identified, countermeasures can be taken. Illnesses become explicable, their causes visible and countermeasures available. In a detailed monograph written by Itani about ethnozoology among the Tongwe, savanna horticulturalists in western Tanzania, only five species of animals with strong supernatural power are mentioned as causes of illnesses (Itani, 1977). The Tongwe folk etiology seems to attach greater importance to sorcery and various spirits than to animals as causes of illnesses (Kakeya, 1977). Although I cannot explain the difference between the Baka and the Tongwe, it is certain that forest animals are better materials for the Baka to explain causes of illnesses than other things.

III. Implication of Identifying Causes of an Illness

While the Baka people recognize that most illnesses (70.5%) have some specific causes, they recognize that almost all illnesses (over 90%) develop spontaneously. This means that they believe almost all of their illnesses are unpreventable. Of course, the Baka people usually avoid eating pathogenic foods and respect social norms so that they may not develop illnesses. In the case of illnesses caused by contacts with pathogens, however, pathogenic foods eaten long ago, pathogenic animals glanced at, the urine of some pathogenic animals or sick persons stepped on and any fish ingested could bring on illness to them or their little children. If they are adults, their contacts with most pathogens are unavoidable. In short, most Baka have grounds to develop all the illnesses which the contacts with pathogenic substances cause. This must be one of the reasons why my Baka informants said that a large part of illnesses which had specific causes developed spontaneously too. When the Baka people search the cause of an illness, except for norm violation and sorcery, they focus only on what pathogens are, not when, where, why or how sick persons had contacts with them. Once a pathogen is identified, that is, a diagnosis has been made, then specific remedies are sought out in huge forest plant resources. Almost all illnesses have specific remedies, most of which are common knowledge among the Baka. Therefore, I believe their search for pathogens is neither for the purpose of removing them nor cutting off contacts with them, but for the purpose of seeking specific remedies.

NOTES

(1) Italics except scientific name denote the Baka language.
(2) Every person among the Baka belongs to his/her father's patriclan to which the term, "*yèe*," refers. A patriclan name of *xxx* is expressed in the word form of "*yèe-xxx*." According to Brisson and Boursier (1979), there are more than 19 patriclans among the Baka society.

ACKNOWLEDGMENTS The field research was supported by the Monbusho International Scientific Research Program (Nos. 02041034 and 06041046) from the Japanese Ministry of Education, Science, Culture and sports. Part of this research was reported in the 6th International Symposium on Traditional Medicine in Toyama in 1997. I am grateful to Dr. J. Dinga-reassi, the Ministry of Scientific Research in Congo, and to Dr. Binam Bikoi, the Ministry of Scientific and Technical Research in Cameroon, who helped me carry out my field research. I also wish to thank Profs. H. Terashima, Kobe Gakuin University and M. Ichikawa, Kyoto University for their valuable advice. I thank all my friends among the Baka hunter-gatherers in Congo and Cameroon, for their kind help and hospitality.

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———— Accepted *January 20, 1998*

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